

## UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF LLEWELLYN PARK, WEST ORANGE, NEW JERSEY, ASSIGNOR TO  
THOMAS A. EDISON INCORPORATED, OF WEST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## METHOD OF PRODUCING SOUND-RECORD TABLETS.

No Drawing.

Application filed October 5, 1926. Serial No. 139,754.

My invention relates generally to the production of sound record tablets and more particularly to an improved sound record tablet of the Edison type and the method of producing the same. A sound record tablet of this type comprises a blank consisting of a main body portion formed of a suitable filler, such as a mixture of wood flour and powdered chalk, mixed with a comparatively small amount of a suitable binder and plasticity agent, such as a shellac or resin, and having a surface layer or veneer for receiving the record impression formed of a material comprising ingredients which react upon the application of sufficient heat to form a final hardened infusible and insoluble condensation product. The material from which the veneer is formed may consist of any fusible resin of phenolic origin, mixed with any material containing the methylene radical  $\text{CH}_2$ , which is capable of reacting with the resin upon the application of heat to form a final hardened infusible product, but preferably consists of a fusible phenol-resin mixed with hexa-methylene tetra-amine as the hardening agent and dissolved in a suitable solvent, for example, alcohol, such as the lacquer or varnish described in United States Patent No. 1,098,608, granted June 2, 1914 to Jonas W. Aylsworth. This material may contain a coloring pigment such as lampblack, and also preferably contains a small amount of para-phenylene-di-amine to increase the speed of the chemical reaction which finally results in the formation of the final hardened product, as disclosed in United States Patent No. 1,283,706, granted to me November 5, 1918.

It has heretofore been customary in producing sound record tablets of the type described above, to provide the record blank or backing with a surface layer or veneer of record receiving material by suitably applying to the body portion of the blank, as by brushing, a priming or sizing coating of the lacquer or varnish referred to, drying this coating in the air, then brushing onto the blank a single additional coating of the lacquer or varnish and drying such coating in the air sufficiently to set it, and thereafter partially curing the surface layer or veneer to bring it to the "rubbery" stage and then subjecting the coated blank to pressure in a record printing mold with the application of heat to

impress the record therein and to bring the surface layer of record receiving material to the final hardened infusible and insoluble state. The sizing or priming coating leaves the blank very rough, as the varnish of this coating sinks or soaks more or less and sometimes almost entirely, into the material of the blank, depending on the porosity of the latter and other conditions. The second or final coating of the shellac or varnish, however, provides a surface layer or veneer on the blank which is smooth and uniform in texture and which apparently constitutes an entirely satisfactory record receiving surface. It has developed, however, that sound record tablets produced as just described deteriorate because of the fact that with the passage of time the surface layers thereof shrink to such an extent and become so rough that the reproductions obtained from such tablets will be appreciably impaired in quality.

The principal objects of my invention are to provide an improved sound record tablet of the type described having a record receiving surface layer which will not deteriorate appreciably over an extended period of time, and also an improved method for producing such a tablet.

As a result of extended experimentation, I have discovered that a sound record tablet such as above described having a surface layer for receiving the record impression which does not deteriorate to an appreciable extent over a period of years, may be obtained by providing the blank or backing of such a tablet after the application thereto of the priming or sizing coating of the varnish or lacquer above referred to, with a plurality of coatings of said varnish instead of with the single additional coating heretofore applied, and by properly treating the coated blanks after the applications of the successive coatings of varnish thereto. In producing such a sound record tablet in accordance with my invention, I preferably proceed as follows: A suitably shaped blank or backing for the sound record tablet to be produced is first formed, preferably of the mixture of materials described above, and has suitably applied thereto a priming or sizing coating of the varnish referred to above, this coating preferably being applied by brushing the varnish in a liquid state onto the blank.

When in a liquid state, the varnish, of course, contains a suitable solvent, preferably alcohol, for the phenol resin. The resin or other material constituting the binding and plasticity agent of the blank or backing to which the coating is applied, is also soluble in said solvent. The varnish constituting this priming or sizing coating soaks more or less into the material of the blank with the result that some of the alcohol or other solvent in the varnish dissolves a certain amount of the resin or other binding agent in the blank, and therefore, as the varnish dries it will be rigidly attached to the blank and substantially integral therewith. After the application of the sizing coating, the coated blank is dried in the air sufficiently so that the varnish of the next coating to be applied will not run into and smear the varnish of the sizing coating to a substantial extent. The sizing coating will then be in a slightly tacky condition. The minimum time required for this drying operation largely depends on the viscosity of the varnish applied and usually takes several hours. A plurality of additional coatings of the varnish or lacquer are then applied to the blank, each such additional coating of varnish preferably being applied in a liquid state by brushing as in the case of the sizing coating. At least two and preferably three such additional coatings of the varnish are applied to the blank. After the application of the second coating, that is, the first additional coating, the blank is again dried in air to evaporate the alcohol or other solvent in the varnish and until such coating reaches a condition in which the varnish of the next coating applied will not run into and smear the varnish of the second coating to any substantial extent. The time required for thus drying the second coating providing the latter is somewhere near the same viscosity as the first or sizing coating, is considerably greater than in the case of the sizing coating, as any alcohol or solvent present in the latter to be evaporated has to work its way up through the said second coating, the minimum time required for this operation usually being several times as long as the minimum time required for drying the first or sizing coating. When the blank is to be provided with a third additional coating, the second additional coating, after being applied to the blank, is likewise dried in the air to evaporate the alcohol or other solvent of the varnish and until it reaches a condition in which the varnish of such third additional coating, upon being applied to the blank, will not run into and smear the varnish of said second coating. The time required for thus properly drying the second additional coating is proportionately longer for varnish of a given viscosity, than that necessary for drying the first additional coating, the minimum time usually required being from about one and

one-half to three times as long as the minimum time required for drying such first additional coating.

After the application of the final coating of varnish, regardless of whether the final coating constitutes the second or the third additional coating above described, the blank is dried in the air until such final coating sets sufficiently so that it will not run. The coated blank is then cured sufficiently by heating, without the application of pressure, to bring the surface layer or veneer to a semi-final or semi-condensed state, or to what is known as the "rubbery" stage, after which it is molded under heat and pressure in a record printing mold, to thereby produce a sound record tablet with the surface layer or veneer, consisting of the condensation product above described, cured to the final hardened infusible and insoluble state and with the record impression or impressions therein. The operations just described are preferably carried out in the manner described in U. S. Patent No. 1,411,425 granted to me April 4, 1922.

It is found that a sound record tablet having a surface layer or veneer of record receiving material produced as described above is greatly superior to record tablets of this type heretofore produced, particularly in respect of the enduring qualities of such surface layer or veneer. The improved surface layer or veneer of such a tablet, as indicated above, comprises or is made up of the sizing or priming coating and a plurality of separately applied additional coatings of material containing a phenolic condensation product.

It is to be understood that the forms of record tablet as well as the method of producing the same specifically described herein, are subject to various changes and modifications without departing from the spirit of the invention and the scope of the appended claims.

Having now described my invention, what I claim as new and desire to protect by Letters Patent is as follows:

1. The method of producing a tablet adapted to be impressed with a sound record groove, which consists in applying to a suitably shaped blank a priming or sizing coating of varnish containing a fusible condensation material, and then a plurality of additional coatings of such varnish, drying the coated blank between the applications of successive coatings of varnish, the duration of successive drying periods progressively increasing, and then curing the coated blank by the application of heat, substantially as described.

2. The method of producing a tablet adapted to be impressed with a sound record groove, which consists in applying to a suitably shaped blank a priming or sizing coating of varnish containing a fusible condensation material and then a plurality of additional coatings of such varnish of substantially the same

viscosity, drying the coated blank in air between the applications of the successive coatings of varnish, the duration of successive drying periods progressively increasing, and then curing the coated blank by the application of heat, substantially as described.

3. The method of producing a tablet adapted to be impressed with a sound record groove, which consists in applying to a suitably shaped blank at least three coatings of varnish of substantially the same viscosity and containing a fusible condensation material, drying the coated blank in air between the applications of successive coatings, the duration of the drying periods progressively increasing, that between the applications of the second and third coatings being several times as long as the minimum drying period between the applications of the first and second coatings, and then curing the coated blank by the application of heat, substantially as described.

4. The method of producing a tablet adapted to be impressed with a sound record groove, which consists in applying to a suitably shaped blank at least three coatings of varnish of substantially the same viscosity and containing a fusible condensation material, drying the coated blank in air between the applications of successive coatings of varnish, the duration of such successive drying periods progressively increasing, drying the final coating until it sets, and then curing the coated blank by the application of heat, substantially as described.

5. The method of producing a tablet adapted to be impressed with a sound record groove, which consists in forming a suitably shaped blank containing filling and binding materials, applying to said blank a priming or sizing coating of varnish containing a fusible condensation product comprising a phenol

resin and a solvent for the latter in which said binding material is also soluble and also a plurality of additional coatings of such varnish, drying the coated blank between the applications of the successive coatings of varnish, the duration of successive drying periods progressively increasing, heating the coated blank until the surface layer or veneer of condensation material thereof is brought to the "rubbery" stage, and then subjecting the coated blank to pressure in a printing mold with the application of sufficient heat to bring the said surface layer or varnish veneer to the final hardened infusible and insoluble state, substantially as described.

6. The method of producing a tablet adapted to be impressed with a sound record groove, which consists in forming a blank containing filling and binding materials, applying to said blank a sizing coating of varnish containing a fusible condensation product comprising a phenol resin and a solvent for the latter in which said binding material is also soluble and then a plurality of additional coatings of such varnish of substantially the same viscosity, drying the coated blank in air between the applications of the successive coatings of varnish, the duration of the successive drying periods progressively increasing, heating the coated blank until the surface layer or veneer of condensation material thereof is brought to a semi-final or semi-condensed state, and then subjecting the coated blank to pressure in a printing mold with the application of sufficient heat to bring the said surface layer or varnish veneer to the final hardened infusible and insoluble state, substantially as described.

This specification signed this 1st day of October, 1926.

THOS. A. EDISON.